RS232/RS485 TO RJ45&WIFI CONVERT SERVER

(USR-WIFI232-610)

Hard version: V1.0

File version: V1.0

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1. Product Introduce

1.1 Function

RS232/RS485 to WIFI & RJ45 serial server is a new wireless networking server, which adopts the latest kernel design. Used to convert RS232/RS485 serial equipment to WIFI or Ethernet networking. Control by mobile phone or laptops, also can be connected to the remote server.

1.2 Features

1. Inner board core module specifications, please reference to USR-WIFI232-C
2. Support hardware flow control (RTS/CTS) RS232 interface, male mouth(needle) consistent with computer pin definition
3. DC5~18V wide voltage input, can provide 2A current MP1482DS DCDC power supply chip, keep system reliability.
4. RS232 RS485 automatic switching
5. RJ45 network connection, support wired Ethernet transmission
6. Reload button, do not worry incorrect settings(in working status, press the button 1s then it load to default settings and automatic restart)
7. Rich status indicator light: Power Ready Link RXD TXD
8. Core module pin is 2.0 spacing stamp holes encapsulation
9. Pin 9 of the DB9 can be connected to power input (solder jumper on the back of PCB), used for power the sensor or the serial port cable power module.

1.3 Electronic Parameters

	Item	Parameter
Wireless parameter	Certification	FCC/CE
	Wireless standard	802.11 b/g/n
	Frequency range	2.412GHz-2.484GHz
	Transmit power	802.11b: +20dBm(Max.)
		802.11g: +18dBm(Max.)
		802.11n: +15dBm(Max.)
		configurable
	Receiver Sensitivity	802.11b: -89dBm
		802.11g: -81dBm
		802.11n: -71dBm
	Antenna Option	External 3Dbi antenna
Hardware Parameters	Data Interface	UART: 1200bps - 230400bps
		Ethernet: 100Mpbs
		GPIOs
	Operating voltage	5-18V (+/-5%)
	Operating current	170mA~300mA
	Operating temperature	-25℃- 85℃
	Storage temperature	-40℃- 125℃
	Dimensions	83×80×25mm
Software parameters	Network type	Station/AP mode, STA+AP
	Security mechanisms	WEP/WPA-PSK/WPA2-PSK/WAPI
	Encryption	WEP64/WEP128/TKIP/AES
	Work mode	Transparent Transmission
	Serial command	AT+instruction set
	Network Protocol	TCP/UDP/ARP/ICMP/DHCP/DNS/HTTP
	Max. TCP Connection	32
	User Configuration	Web Server＋AT command config
	User Application SW	Support customized application software

1.4 Packing List

- USR-WIFI232-610 *1
- 5V1A power adapter *1
- Serial cable *1
- Network cable *1
- User guide CD *1

2. Hardware Instructions

2.1 Indicator Light

There are 5 lights in total, from left to right

Indicator	Function	Description
Power	power	Keep light when power on
Ready	Inner LINUX start	Keep green light when connected to network correctly
Link	Network link	Light when establish network link
TXD	Transmit data	Flash when send data
RXD	Receive data	Flash when receive data

2.2 Interface Instructions

2.2.1 Power interface:

5.5*2.1 standard 5-18v power interface, with TVS protection

2.2.2 RS232 interface:

Device serial port is male(needle), RS232 level (can connect to PC directly), pin order is consistent with PC COM port. Use cross cable connected with PC(2-3cross,7-8cross, 5-5 direct, 7-8 can disconnect, but MUST NOT connect with PC directly), There are 6 pins in work, others is NC.

ID	NAME	DESCRIPTION
2	RXD	Receive data pin
3	TXD	Send data pin
5	GND	Data Ground
7	RTS	Request to send
8	CTS	Clear to send
9	VCC	Can connect to module power input by join the PCB jumper, default not connect.

2.2.3 RS485 interface:

Rs485 two wire links, A(DATA+), B(DATA-), when link to other RS485 device, A(+) to A(+), B(-) to B(-).

2.2.4 RJ45 interface:

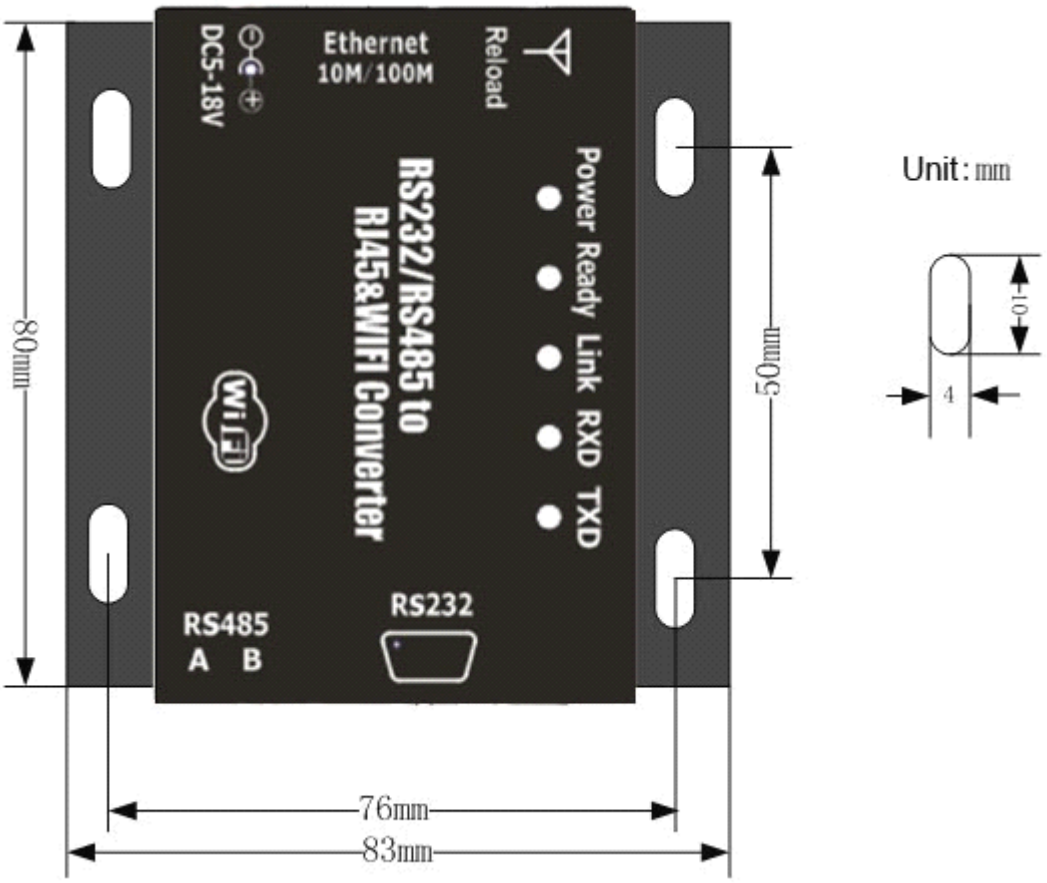
Network port connection, module is 10M/100M adaptive, support AUTO MDI/MDIX, which means you can use direct network cable to connect with PC also can be tested. Module by default closed, need AT command settings to open, as shown in the module specifications.

ID	TAB	FUNCTION
1	TX+	Transceiver Data+
2	TX-	Transceiver Data-
3	RX+	Receive Data+
4	PHY-VCC	Transformer tap voltage
5	PHY-VCC	Transformer tap voltage
6	RX-	Receive Data-
7	n/c	Not connected
8	n/c	Not connected

2.2.5 Reload key:

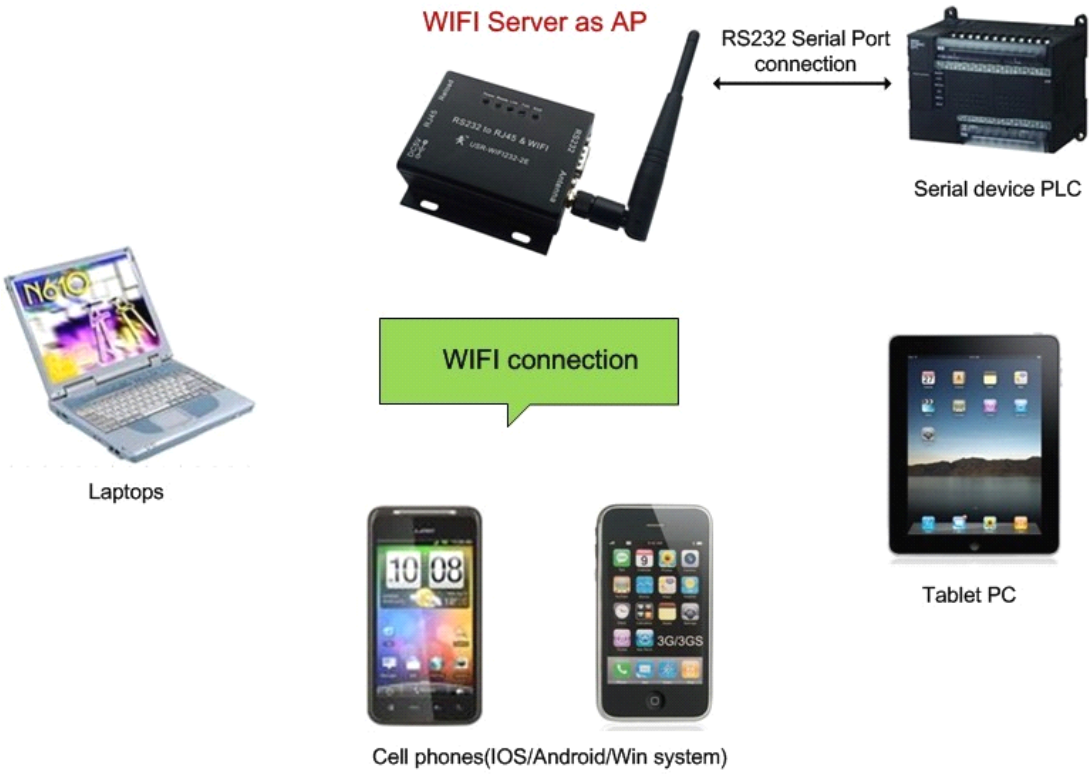
This key used for set up the module to factory setting, when module is working (Ready LED on), press this key more than 1 seconds and free it, wait about 10 seconds until the module restart, the green LEDs all off and then Ready LED on. Then the module goes to factory default settings.

2.3 Size and install



3. Application

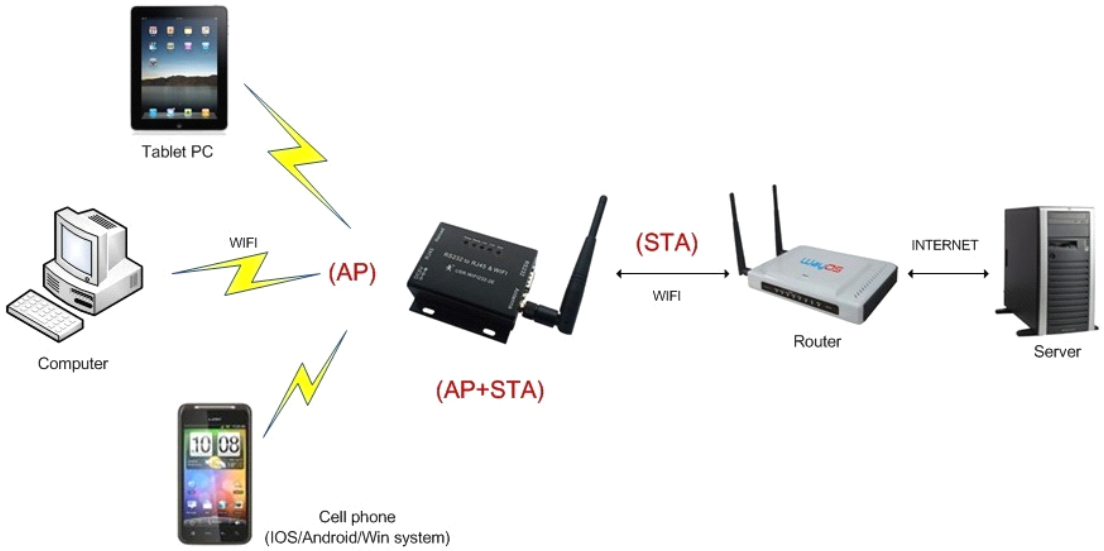
3.1 Application of AP



3.2 Application of STA

USR-WIFI232-610 as STA(use the AP CLI interface), connect to other AP, to compose a wireless network. All of the STA take AP as the wireless network center, and the mutual communication between STA is through AP forwarding.

3.3 Application of AP+STA



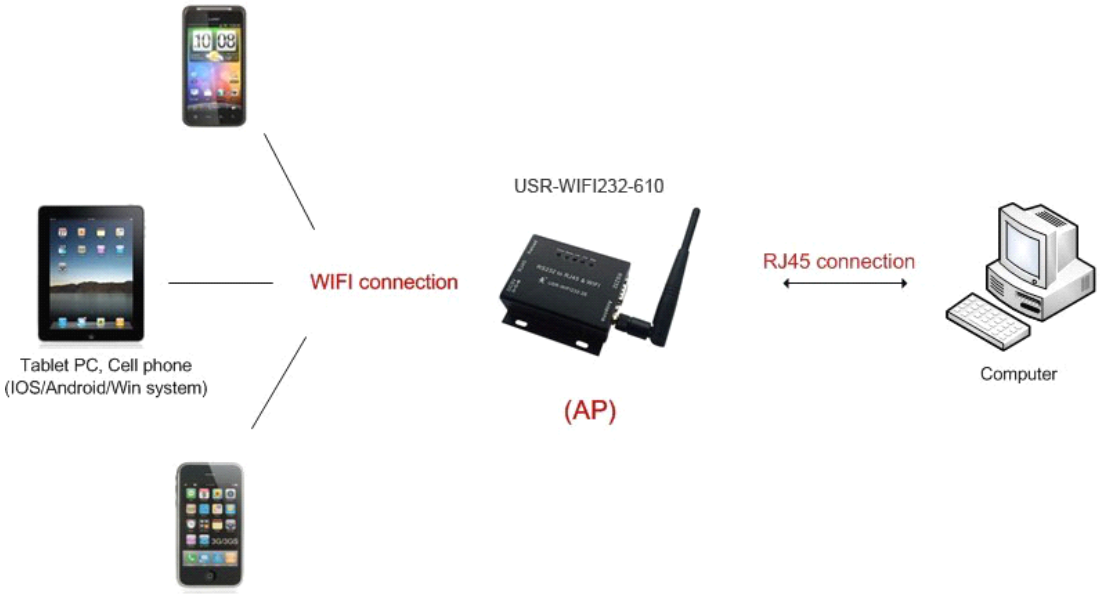
USR-WIFI232-610 can support AP+STA mode. That is the module support a AP interface and a STA interface at the same time.

AP+STA function settings:

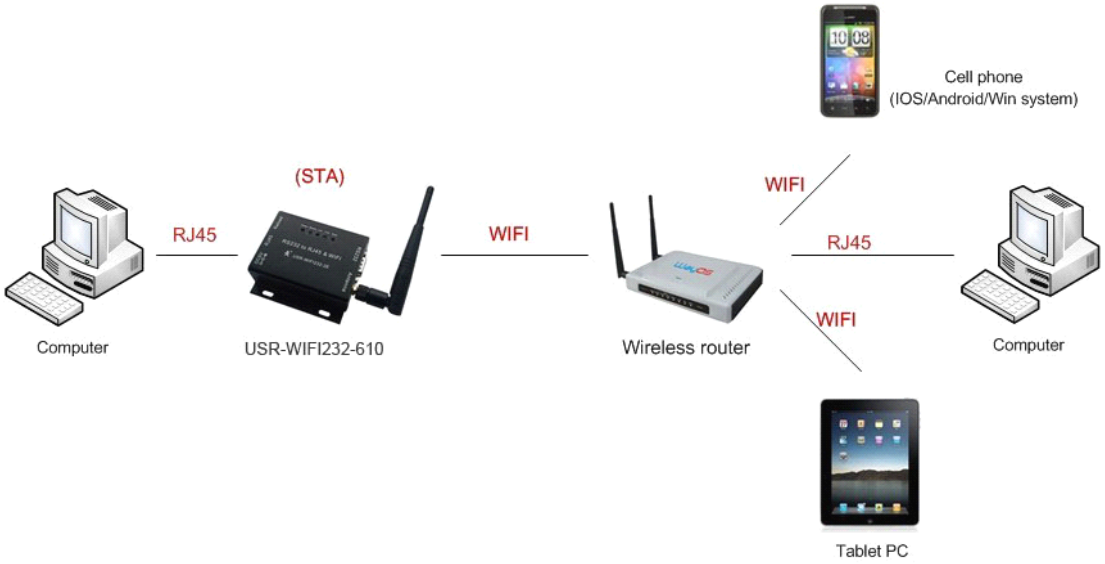
AP+STA function need to set through serial command.

- AT+FAPSTA=on set AP+STA function
- Then set module to STA mode, the AP interface still valid

3.4 Wired and wireless Application drawing

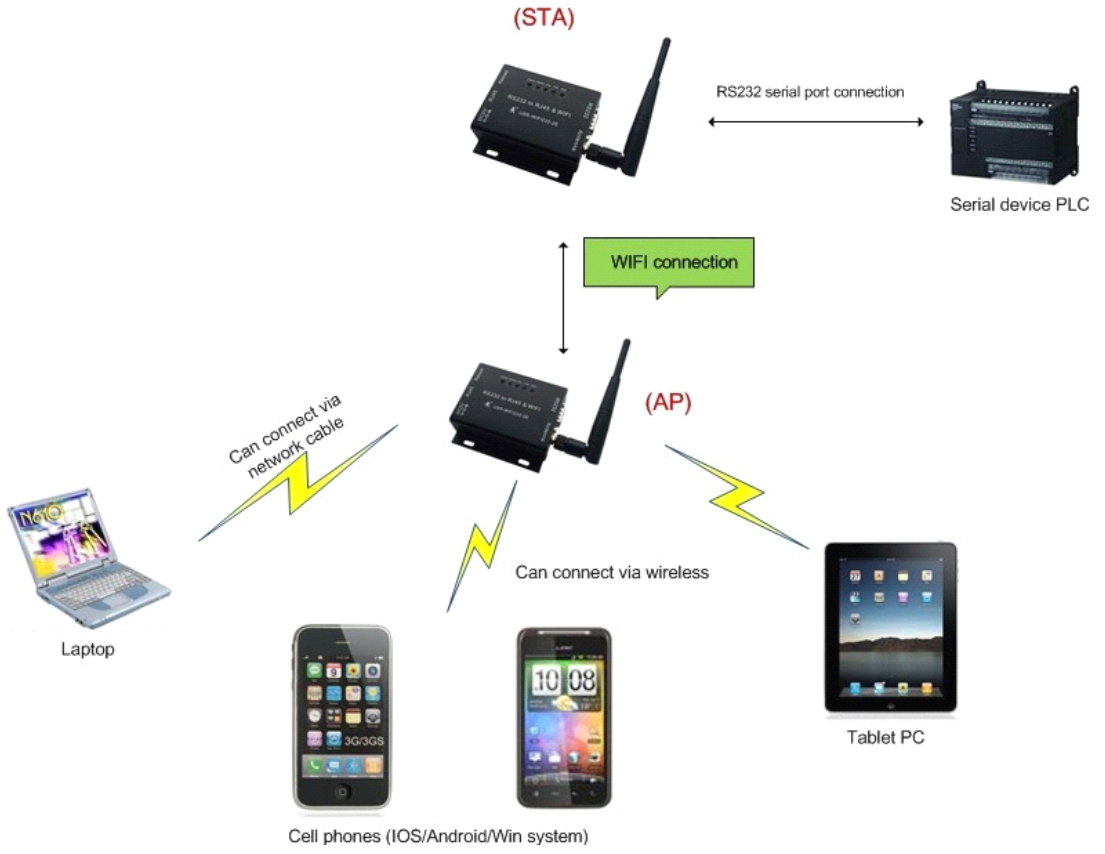


When USR-WIFI232-610 used as AP, other computers and equipments can be used as STA connected to this device through RJ45(network cable).



When USR-WIFI232-610 used as STA, network port connected to computer via RJ45, wireless added to wireless router to networking.

3.5 Application of wireless serial port(one AP, one STA)



USR-WIFI232-610 module can be set as STA or AP. So the device logically supports two wireless interfaces, one as STA, another interface is equivalent to a AP, other STAs can connect to wireless network via the module AP interface.

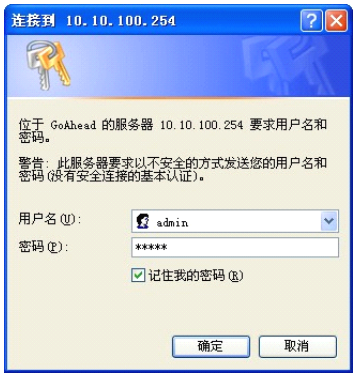
4. Function Specifications and Test

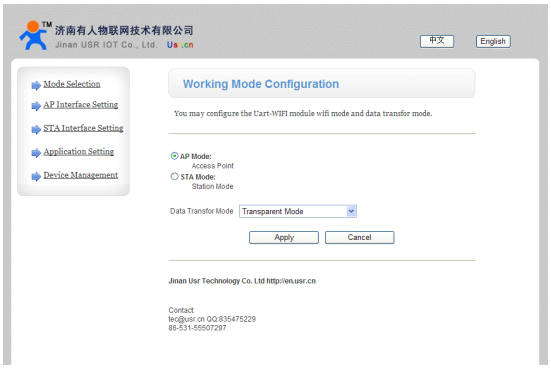
4.1 Module setting

USR-WIFI232-610 internal complete protocol conversion, customers does not need to care about the details. The serial port side serial data transparent transmission, WIFI network side is TCP/IP packet, specify the working details through simple settings. Can be set by module built-in webpage, by serial port using AT command and by our software in CD.

4.1.1 Set up via Web pages

Keep WIFI network connection, login web page http://10.10.100.254, the user name and password are both admin.

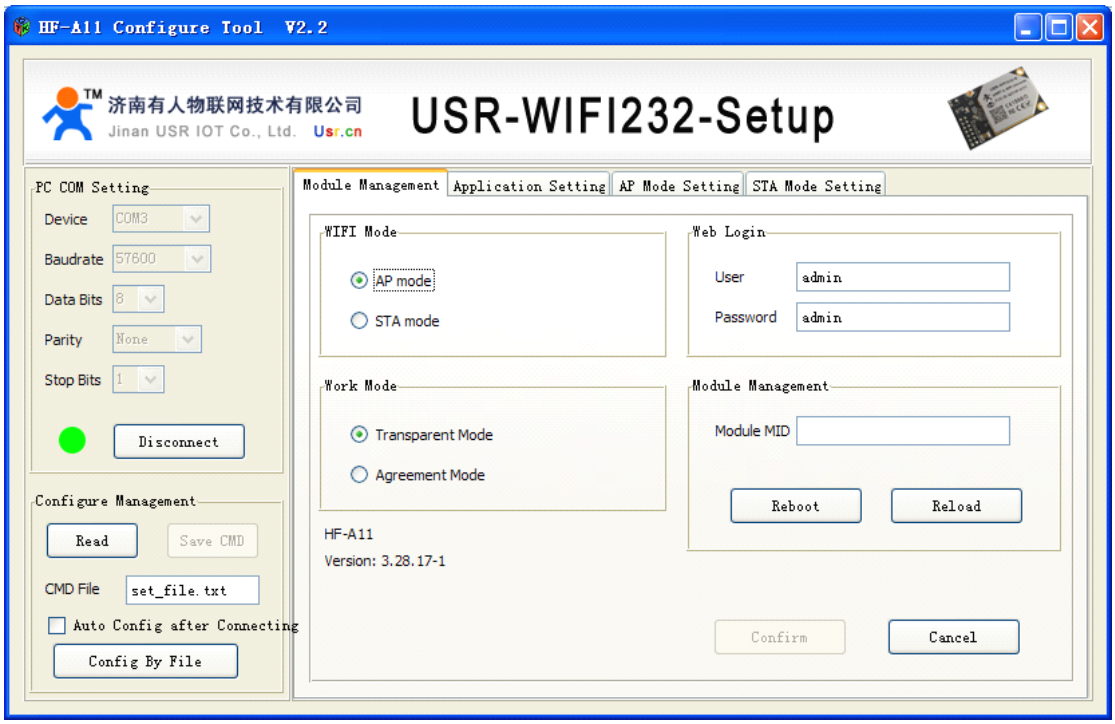




4.1.2 Set up via COM port

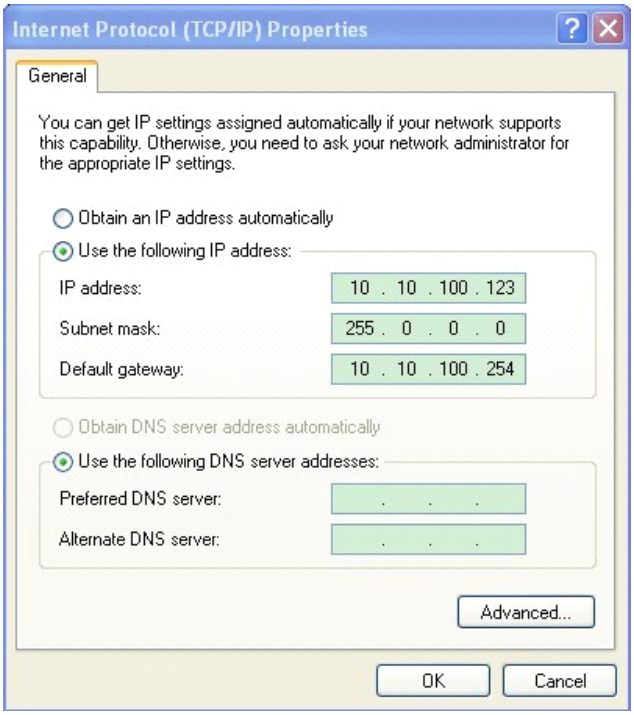
Connect the module COM port to PC COM port, install the software runtime lib,

then run A11_Config_serial_en.exe , click Connect, after success, click Read, then you can setup the settings.

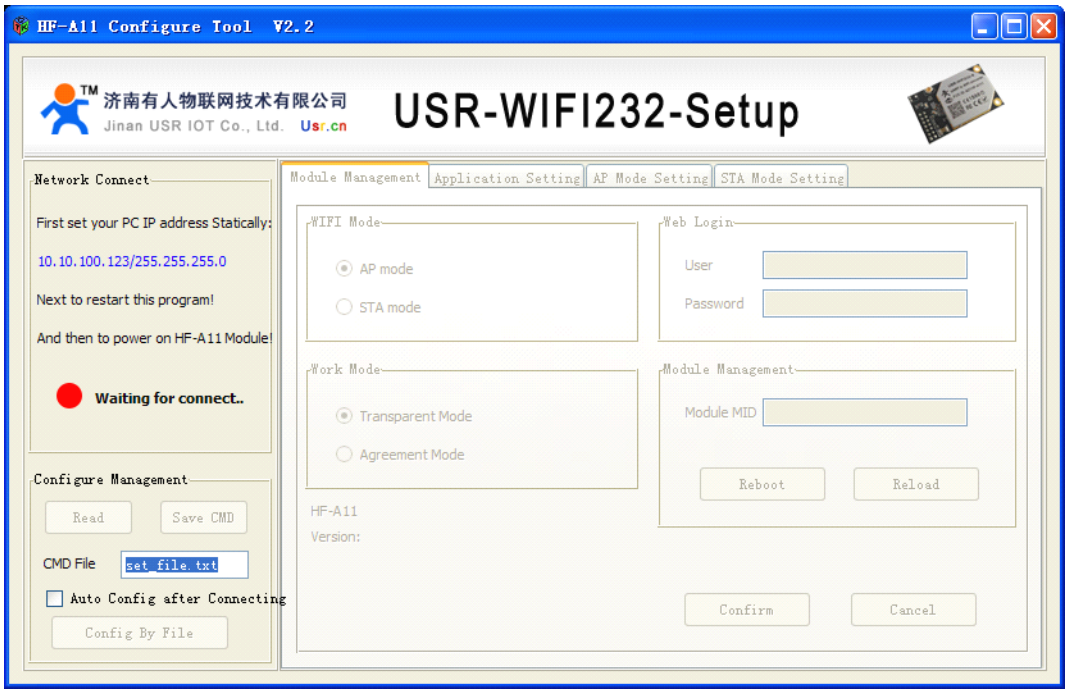


4.1.3 Setup via WIFI Software

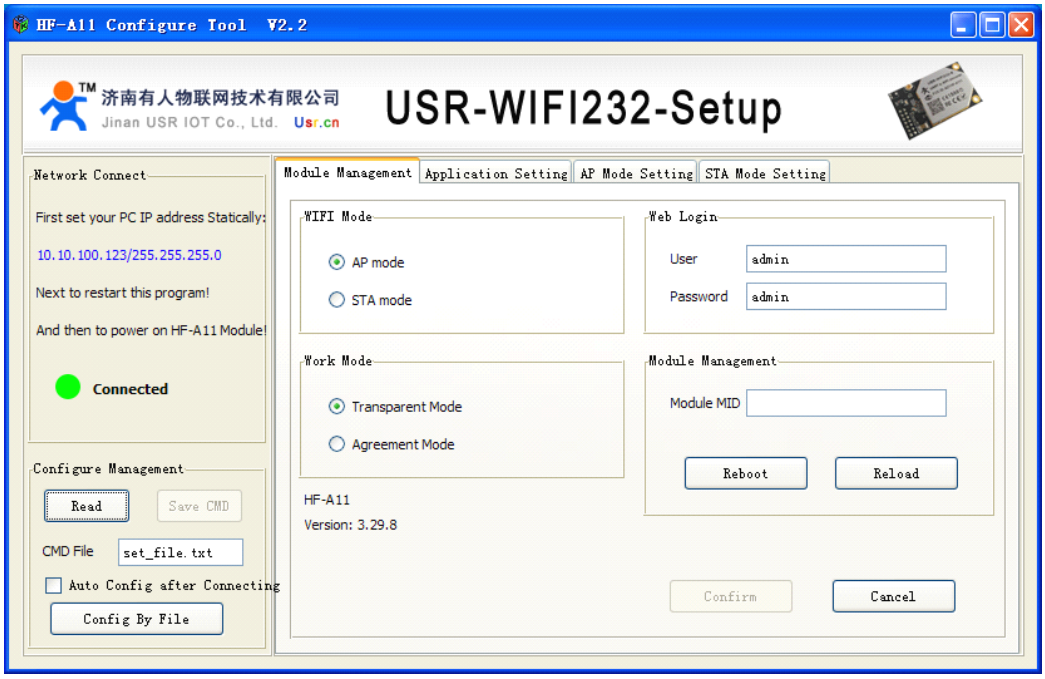
Only firmware after than 3.29.xx has this function, You can find your firmware version in the web pages, use WIFI network to setup the module, you still need to install the gtk2-runtime.exe, Open WIFI network card and Forbidden RJ45 network card, setup PC IP address to 10.10.100.123.



Run A11_Config_net_en.exe



Power off and on module, Wait the module start up, connect WIFI network card to the module HF-A11x_AP network, after WIFI network ok, the module will auto connect to the setup software, the led go to Green, Click Read, then you can configure the WIFI module settings.

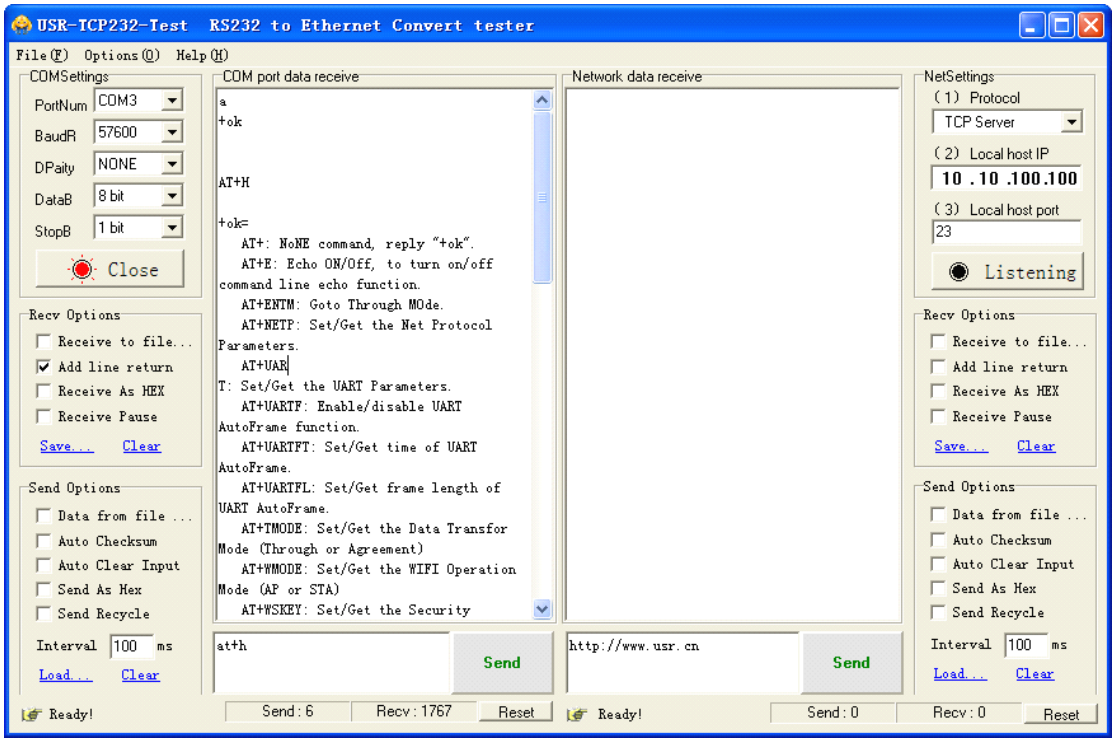


4.1.4 Hand AT Command

This method is similar with 2.2, it is by hand while the 2.2 do by software. This show the AT commands work detail, if you would like to configure the module via you MCU, this is important for you.

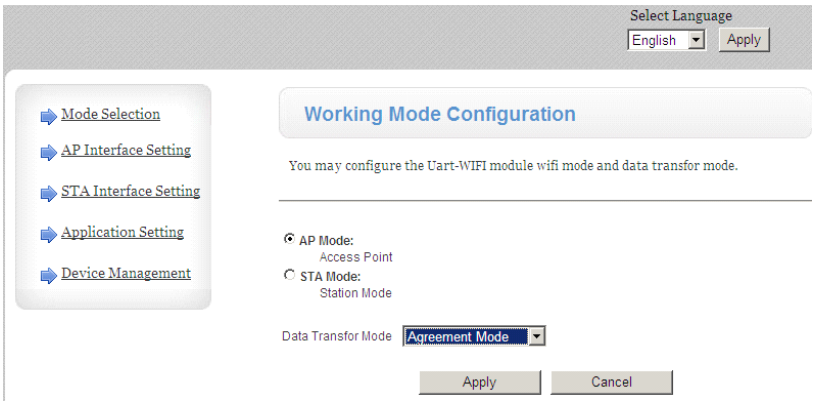
Connect your module COM Port to PC COM port.

First send three plus signs +++, notice only three chars, no <CR> and no <LF>, you will receive a char a send back from module, then in three seconds, send back a char a back to the module, after that you will receive +ok to notice it has go in to AT command mode, send AT+H and Enter (CR and LF ,0x0D + 0x0A) to get help, AT+ENTM and Enter for back to transparent transmission mode. More detail AT commands description please see the data sheet, the test step screen is here, (Only receive message, send chars can't be see)



4.2 Serial to WIFI transparent transmission

USR-WIFI232-610 support serial port transparent transmission mode, can realize RS232 serial plug and play, to minimize the complexity of using. In this mode, all data that need transmit and receive are transparent transmission between serial interface and WIFI, don't make any resolution.



In transparent transmission mode, can be completely compatible with users original software platform. The user equipment do not need to have basic software change, to realize the wireless data transmission.

<Reminding:>
Transparent transmission mode as a lower level data transmission, itself can not guarantee zero error rate in data transmission. The users can adopt higher level TCP protocol handshake or open the serial port hardware flow control function(RTS/CTS), this will reduce the error rate to the lowest. If the users does not need serial port hardware flow control function, just put the corresponding pin feet(CTS/RTS) vacant.

4.3 Serial to Ethernet transparent transmission

USR-WIFI232-610 device provides a 100M Ethernet interface, through which customers can realize WIFI port, Serial port and Ethernet port these three ports interworking. In building network aspect, The USR-WIFI232-610 support bridging mode and routing mode to deal with different specific applications.

<Reminding:>
For different networking mode, USR-WIFI232-610 require commands to switch version(as description of N-Ver and Z-Ver below). Use command AT+FVER=n to switch to N-Ver, AT+FVER=z to switch to Z-Ver. Default N-ver

4.4 Ethernet to WIFI transparent transmission

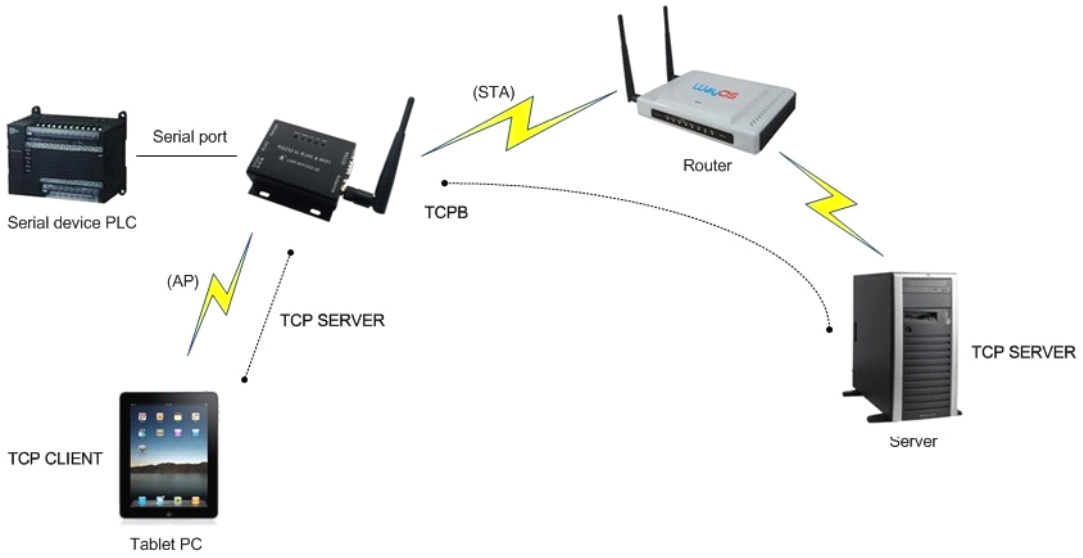
For these embedded system equipments that without operating system or no USB port to extend WIFI card, you can use the module Ethernet to WIFI transparent transmission function. So with strong signal, this module can also work in the distance that general USB network card can not competent. Even can make half cable network and half wireless for longer distance. (Please reference to Ethernet to WIFI transparent transmission documents)

4.5 Wired network+WIFI to serial

USR-WIFI232-610 support serial to Ethernet and serial to WIFI communication at the same time. As shown in picture, USR-WIFI232-610 set as TCP Server, support Ethernet and WIFI communicate with module at the same time. If module as TCP Client, serial port will access to TCP Server to communicate automatically.

4.6 AP+STA Instruction

USR-WIFI232-610 can support the AP+STA mode. That is the module support a AP interface and a STA interface meanwhile, as shown below:



In the picture, USR-WIFI232-610 use the AP+STA function, module STA interface can be connected to router, and network server through TCP connection. At the same time, the module AP interface is also available, cellphone/PAD ect can connect to AP interface(through TCPB connection) to control serial equipment or set the module.

- With AP+STA function, can easily use hand equipment such as cellphone or PAD to monitor user equipment, without changing the original network settings.
- With AP+STA function, can easily set the module, solving the problem of module can only through serial port settings as STA in the past.

AP+STA function settings:

The AP+STA function need to be set by serial command.

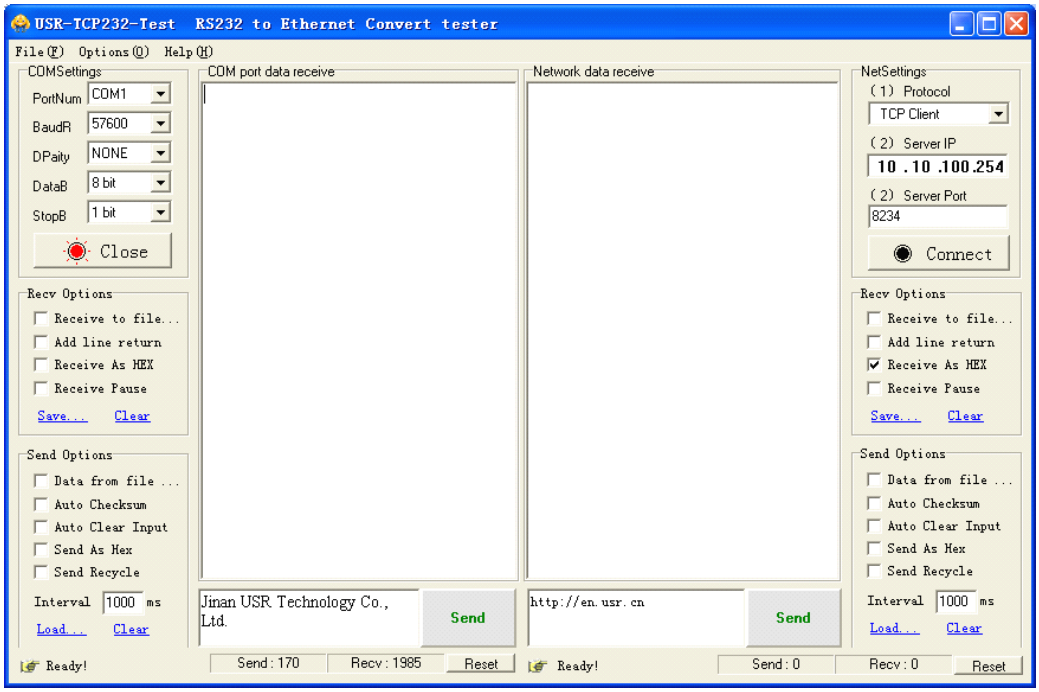
- AT+FAPSTA=on set AP+STA function.
- Then set module as STA mode, AP interface is still valid.

5. Program Resources

We provide computer and Android software free for customers, as well as the PC programming code. ISO version USR-TCP232-Test and Server data forwarding platform is developing.

5.1 Computer USR-TCP232-Test

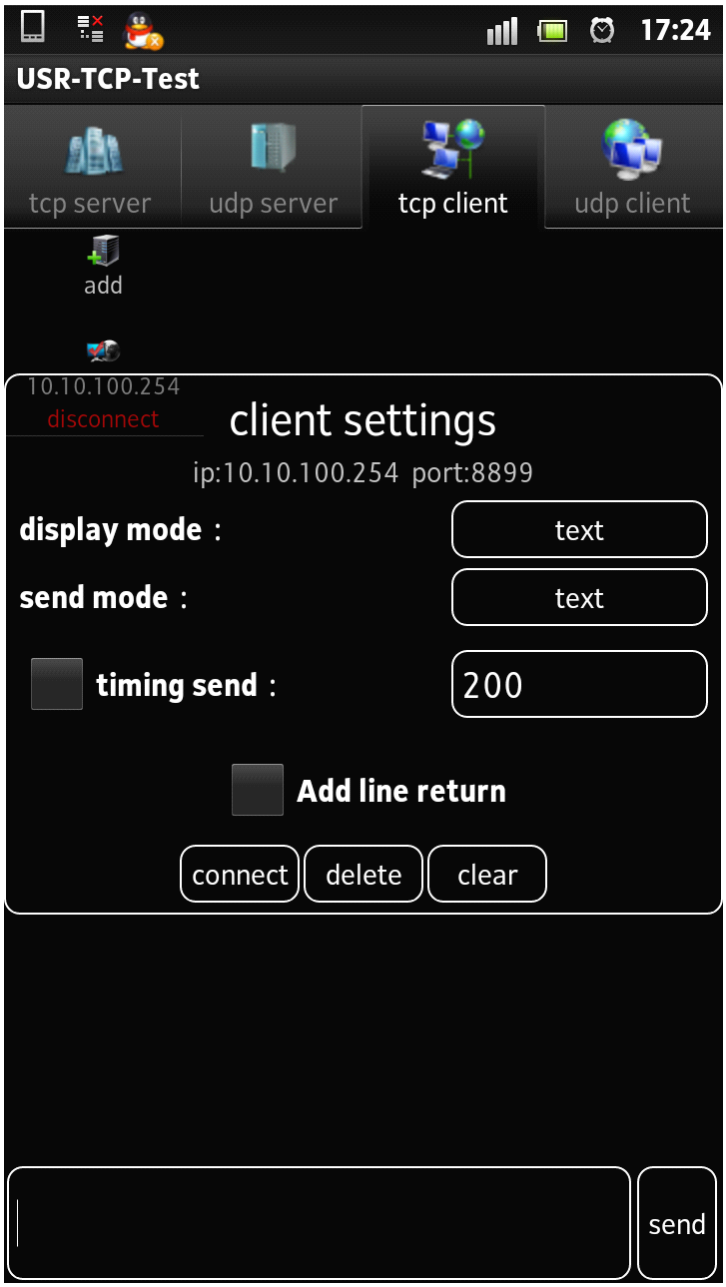
USR-TCP232-Test.exe



USR-TCP232-Test.exe is developed by Jinan USR IOT Technology Co., Ltd, the serial port and network commissioning test software combo.

To test the serial port to the RJ45/WIFI network communication, we connect USR-WIFI232-610 RS232 port to computer, RJ45/WIFI network port also connected with computer network(reference to USR-WIFI232-X.-4.0 3.2 chapter)

5.2 Android USR-TCP232-Test



Android network test assistant(TCPIP UDP test). This is a tool that cellphone or tablet debugging for TCPIP, Configure WIFI to serial port mode, it can realize the cellphone debugging serial communication.

This software support TCP Server, TCP Client, UDP Server, UDP Client mode, support English automatic switching.

This program developed by Jinan USR IOT Technology Co., Ltd, just for customers free test usage, please do not directly used for commercial purposes.

5.3 IOS USR-Socket Tools

Iphone APP store link: https://itunes.apple.com/us/app/usr-sockettools/id630433197?mt=8
Or you can input USR-SocketTools to search

USR-SocketTools is suitable for any network device, support TCP Client, TCP Server, UDP. Through your Iphone to realize sending data to specified IP and port, easy to test.

5.4 Socket programming test(VB Dephi Poland c++)

Remark: OEM and ODM accepted

6. Contact us

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